

Berlin Leipzig Seminar
Analysis/probability theory
First Meeting Summer Term 2009

Organized by the DFG Research Group *Analysis and Stochastics in Complex Physical Systems*

DATE: **Friday, 17 April 2009**

VENUE: **Max Planck Institute, Inselstr. 22, 04103 Leipzig, Room A01**

PROGRAMME:

9:40 – 10:30: Abdelhadi Es–Sarhir (Technical University Berlin)

A priori estimates of invariant measures for semilinear SPDE's and applications

Abstract: We study existence and a priori estimates of invariant measures μ for a class of semilinear stochastic differential equation with additive noise on a separable Hilbert space. Furthermore, we discuss the corresponding parabolic Cauchy-problem in $L^1(\mu)$. Particular emphasis will be put on stochastic reaction diffusion, and Cahn-Hilliard equations.

10:40–11:30: Marek Biskup (University of South Bohemia Ceske Budejovice)

Gradient models with non-convex interactions

Abstract: I will discuss some results on gradient models with non-convex interactions. In a specific example, which allows a reformulation by means of Gaussian gradient model with random coupling constants, I will show that in the absence of convexity, there could be more than one gradient Gibbs measures with zero tilt. Nonetheless, the large scale fluctuation structure in all such measures is still that of Gaussian Free Field. I will attempt to provide a sketch of some proofs. Based on joint works with R. Kotecky and H. Spohn.

11:40–12:30: Stefan Adams (Warwick University, MPI Leipzig and LMU Munich)

Strict convexity of the surface tension of Gradient models with non-convex interactions

Abstract: Effective interface models - seen as gradient fields - enable one to study effective phase coexistence. In the probabilistic setting gradient fields involve the study of strongly correlated random variables. One major problem has been open for several decades. What can be proved for the free energy and the Gibbs states for non-convex interactions given a non-vanishing tilt at the boundary? We present in the talk the first break through for low temperature using Gaussian measures and renormalisation group techniques yielding an analysis in terms of dynamical systems. We outline also the connection to the Cauchy-Born rule which states that the deformation on the atomistic level is locally given by an affine deformation at the boundary. Work in cooperation with R. Kotecky and S Müller.

Everybody is welcome to attend.

Wolfgang König, University of Leipzig